AMERICAN ELECTRO-PLATERS SOCIETY

(An Educational Society)

Chartered 1909

MONTHLY REVIEW

APRIL, 1916

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Yesterday is gone—forget it.
Tomorrow never comes—don't worry.
Today is here—use it.

MONTHLY REVIEW

American Electro-Platers' Society

(An Educational Society)

Vol. 3 APRIL No. 4

EDITORIALS

We regret that in the March Review we doubted the veracity of Mr. Barrows' fifty fish before breakfast fish story. We are in receipt of a letter from our President, giving such full particulars, such convincing details of his morning catch that we are compelled to believe every single fish of it; fifty fish from 5.30 a. m. to 6.46 a. m., same morning, all perch, some catch. We thought the story was a Miss Arris, but we find that the fish were caught in Lake Harris. Our aquatic exploit at Dayton fades into insignificance, and we cheerfully relinquish the title of Commodore to our Supreme President.—Ed.

To the tireless energy of Mr. Joseph Walters, of Richmond, Va., we are indebted for securing the valuable paper on nickel plating, by Messrs. F. C. Mathers, E. H. Stuart and E. G. Sturdevant, which is published in this issue; the thanks of the Review are also extended to the American Electrochemical Society for allowing us the privilege of presenting this paper to members of the American Electro-Platers' Society.

AMERICAN ELECTROCHEMICAL SOCIETY.
Office of the Secretary.
South Bethlehem, Pa.

Mr. Joseph Walters,
Southern Stove Works,
Richmond, Va.

My Dear Sir:—

Answering your request of February 2nd, I am, with the approval of the President of our Society, enclosing a copy of the paper with a special heading, and agree that you may publish the paper in your monthly review for April, if you publish it just as enclosed copy, so that there will be no doubt that it is published only by you with special permission of this Society, and is not an unauthorized publication in advance of our meeting.

Very sincerely yours,
Jos. W. Richards,
Secretary.

Above proposition agreed to:
Arthur L. Walker,
Chairman Publication Committee.

[Published in this Journal by special permission of the American Electrochemical Society in order to encourage discussion at the meeting.]

A paper to be presented at the Twenty-ninth General Meeting of the American Electrochemical Society, in Washington, D. C., April 27-29, 1916.

[*Advance Copy. Printed; Not Published. Discussion Invited. For Release April 29.*]

NICKEL PLATING.

By F. C. MATHERS, E. H. STUART and E. G. STURDEVANT.

This work was undertaken at the suggestion of Dr. W. D. Bancroft, chairman of the Committee upon Electroplating appointed by the American Electrochemical Society in May, 1913. The idea in this work was to find the nickel plating bath which would give the best deposit at the highest current or voltage, and to discover the effect of each constituent of the bath on the plating operation.

It is not assumed that the results obtained in the laboratory with small baths can be duplicated exactly in commercial work, but it is thought that these results may point the way to improvements in nickel plating. The man who works daily for long periods of time at nickel plating finds out many things about the solutions that never occur to one engaged in the scientific study of a bath for a short time. The practical plater must make the final decision concerning the best bath.

Unfortunately there was no method of quantitatively recording the value of the deposits from the various baths as regards smoothness, adherence and softness, consequently the deposits can only be qualitatively compared by a word description of their general appearance and properties.

Manipulation.

Beakers of 350 cc. (0.74 pints) capacity were used as electrolyzing vessels. The volume of each bath was 300 cc. (0.61 pints). Two anodes and one cathode were used in each bath. The distance between the anodes was 4.5 cm. (1.77 in.), hence the distance from the cathode to each anode was 2.25 cm. (0.885 in.) The anodes, unless otherwise stated were the ordinary nickel-iron alloy containing about 92 per cent nickel and about 6.5 per cent iron. In some of the work, "strip" pieces of 99.8 per cent electrolytic nickel cathodes were used directly as anodes. These are referred to as "pure." The anodes were suspended by lead strips, and were placed in cloth bags. The area of the cathode and the area of the anodes on the sides towards the cathode was each 50 sq. cm. (0.78 sq. in.). The cathodes of sheet copper were polished with tripoli and rouge on a cloth wheel and then carefully cleaned with the usual precautions. Electrolysis was at room temperature, 22° C. (72° F.) In preparing the baths, the boric acid was added after the other constituents had been dissolved in water neutralized with nickel hydroxide or carbonate and filtered. The composition of the baths, given in per cent by volume or parts in 100 parts of water, may be changed to ounces per gallon by multiplying by 1⅓, or, to be more exact, 1.3361. Unless otherwise stated, a current density of 1.6 amp. per sq. dec. (14.8 amp. per sq. ft.) was used when possible,

but if this high current produced a black deposit or caused gas evolution, the current was reduced until a good deposit was obtained. Electrolysis was continued for 1.25 hours, thus giving a deposit approximately 0.001 in. (0.0025 cm.) thick, which is a greater thickness than is generally produced commercially. If the bath was run at a lower current, electrolysis was continued until the deposit reached this thickness. A poor bath may give an apparently good thin deposit at a low current, but only a really satisfactory bath will give a good thick deposit at this unusually high current.

Voltage readings were of little value, because of variations caused by impurities in the anodes and by changes in distance between electrodes. In the better baths the voltage was about 2 to 2.3.

In the course of this work several hundred baths were prepared and tested. The first step was to make up the various baths which were described by Watts[1] in the review upon nickel plating. It was found that all of the baths which gave good deposits contained a comparatively few salts[2]. The salts most commonly used are: nickel ammonium sulphate, nickel sulphate, nickel chloride, boric acid, magnesium sulphate and sodium chloride. The less

[1]Trans. Am. Electrochem. Soc. (1913), 23, 99.
[2]Mr. H. V. Houseman assisted with this part of the work.

usual additions are citrates and tartrates. The result of changing the proportions and combinations of these salts was further investigated. It was thought necessary to report in this paper only the most important final data and conclusions, which are as follows:

Pitting.

Pitting of the cathode is caused both by the adherence of loosened, insoluble particles of anode or other solid, hard material and by the adherence of gas bubbles. Before buffing, cathodes with much of this adhering material, feel somewhat like sandpaper. The buffing pulls these adhering particles away, leaving holes in the nickel plate. This trouble can be best avoided by keeping the anodes in bags which retain all the loosened material. It can also be prevented by not stirring or agitating the solution within eight hours of the time of using, thus allowing the solid particles to remain upon the bottom. The formation of gas bubbles may be largely avoided by using a small enough current or voltage, by selecting a good composition of bath, and by maintaining the solution only slightly acid.

Use of 99.8 Per Cent Nickel Anodes.

Formerly a nickel-iron alloy containing about 92 per cent nickel and 6 per cent iron was used as anode because it was supposed that pure nickel would not dissolve. Recently there has been a tendency to use purer anodes containing at least 95 per cent nickel, and not more than 2.5 per cent tin, 1 per cent iron and 1.5 per cent other impurities. The objection to any but a pure anode is that the composition of the bath will gradually change unless all the metals dissolved from the anode are redeposited on the cathode in the same proportion in which they are present in the anode, even if the cathode and anode efficiencies are 100 per cent. In the ordinary plating bath, part of the iron is deposited upon the cathode and

part of it is oxidized by the air to a basic salt, which goes into the sludge or precipitate. This produces a decrease in the concentration of nickel in the bath equivalent to the iron and nickel in the sludge, but tends to purify the deposit because only the iron remaining in solution can be deposited. Ammonium citrate in the ordinary nickel bath prevents the formation of sludge, consequently the composition of the bath remains almost constant, but the deposit is more impure and may be darker in color because practically all of the iron that was in the anode is deposited with the nickel on the cathode. This difficulty can be avoided by the use of pure anodes made of electrolytic nickel. Some "strip stock" pieces of 99.8 per cent pure nickel cathodes, kindly furnished by the International Nickel Company, were used directly as anodes. These anodes dissolved with approximately theoretical efficiency if chlorides were present in the baths. A bath containing 7 per cent nickel ammonium sulphate, 7 per cent nickel sulphate, 2 per cent magnesium chloride, 1 per cent boric acid, and 0.2 per cent ammonium citrate gave an anode efficiency of 99.71 per cent and a cathode efficiency of 95.67 per cent at a current density of 1.5 amp. per sq. dec. (13.9 amp. per sq. ft.) at both electrodes. In a similar bath, except that magnesium chloride was absent, the anode and cathode efficiencies were 17.5 and 60 per cent respectively. This shows the necessity of having some chloride present in the bath. Nickel chloride or sodium chloride was also satisfactory. In a single salt bath containing 10.5 per cent nickel sulphate, 3.5 per cent boric acid and 1.8 per cent sodium chloride with current densities of 2.1 and 1.4 amp. per sq. dec. (19.5 and 13 amp. per sq. ft.) at both electrodes, the efficiencies were respectively 99.4 and 99.7 per cent for the anodes and 98 and 98.7 for the cathodes.

There was some shedding of small loose pieces from the anodes, which made bagging necessary for the maintenance of a perfectly clear solution.

From the results of this work, it seems that pure nickel anodes should be used, because of the better color of the deposit, the greater range of conditions which are possible without the appearance of dark or bad deposits, and the better maintenance of a constant composition of the bath. Pure nickel anodes are also more economical, because they cost no more per pound than the 95 per cent alloy.

Preventing Sludge.

Ordinary nickel baths using ferronickel anodes soon become turbid and gradually a sludge or precipitate settles to the bottom of the vessel. Very much less sludge is formed if pure electrolytic nickel anodes are used. Less sludge is said to be formed in single salt baths which contain no ammonium. An analysis of dried sludge from a bath using ferronickel anodes showed 39 per cent iron oxide (Fe_2O_3) and 8 per cent sulphate (SO_4). If the cathode reaches into this sludge, the finished plate has a frosted appearance resembling a deposit on improperly cleaned work. Deeper baths than required to hold the articles being plated must be used in order to give room for this sludge to accumulate. At intervals the entire bath must be filtered and the tank cleaned. An additional ad-

vantage of a bath free from sludge would be the possibility of moving the cathodes or stirring or agitating the solution during electrolysis whereby a greater current or voltage could be employed.

Ammonium citrate, a solvent for iron and nickel hydroxides, will entirely prevent the formation of a sludge in nickel plating baths. Only from 0.2 to 0.3 per cent was required to keep the baths perfectly clear and free from turbidity during the course of the experiments tried. but further small additions might have to be made from time to time in commercial baths. Larger amounts in some baths tend to darken the deposits. In all the later experiments in this work, ammonium citrate was used, even in the single salt baths with pure anodes, because some sludge is formed in all baths which contain no citrate.

Purity and Color of Deposits.

Ordinary nickel plating should more properly be called ferro-nickel plating[3], because many commercial deposits contain 3 per cent or more of iron in those cases where the anodes contain 6 to 8 per cent of iron, which is the recognized composition of the older cast anodes. The rest of the iron goes into the sludge in the bath. The ammonium citrate, which keep all of the iron in solution and prevents the formation of sludge, gives a deposit containing approximately as much iron as was in the anode. Using an anode containing 6.49 per cent iron, the deposit contained 6.23 per cent iron when ammonium citrate was in the bath, but only 3.31 per cent of iron in a deposit from a similar bath containing no ammonium citrate. This iron in the nickel deposit is one of the chief causes of the dark or bluish color. The addition of 0.5 per cent ferrous sulphate to a bath containing citrate made the deposit very much darker before buffing and more blue after buffing. Addition of another 0.5 per cent of ferrous sulphate made these changes more pronounced. These cathodes were harder, less smooth and more difficult to buff. Salts of the alkali metals, both organic and inorganic, darken the deposits largely through their action on the iron. With pure anodes, the darkening is much less or even absent altogether.

[3]Bancroft, Trans. Amer. Electrochem. Soc. (1906), 9, 217.

The question of the effect of the 2.5 per cent of tin which is present in the newer 95 per cent anodes was not studied. The claim that these anodes produce less sludge indicates that the tin is redeposited on the cathode, but the statement is also made[4] that the tin goes into the sludge as a hydrated oxide.

Lead Hooks or Wires for Hanging Anodes.

Lead hooks or wires can be used to hold the anodes in position. The entire anode can be immersed in the bath, with only the lead hook extending above, consequently the scrap nickel from anodes may be reduced to almost nothing. It seems that in commercial work, too, lead hooks could be used to advantage in suspending the anodes, since the copper, at present used. must not touch the solution. The lead peroxidized only slightly on the surface.

Acidity and Acids.

Boric acid, 1 to 3 per cent, should be used in all of the baths. Citric, acetic or benzoic acid cannot be used in place of the boric

acid, perhaps due to the comparatively small quantity of these acids which can be added without making the bath acid to Congo red, but it may be that the boric acid has an action other than as an acid. With the boric acid present, the more free sulphuric acid that is added without making the bath acid to Congo red, the more shiny the deposits before buffing.

Use of Magnesium Salts and Alkaline Metal Salts.

Magnesium sulphate or chloride in baths containing nickel ammonium sulphate improves the color of the deposit by making it whiter, and large amounts (up to 10 per cent) can be added without any apparent injurious action, even when impure anodes are used.[4] The addition of sodium, potassium or ammonium salts in rather large amounts (1 to 2 per cent do not show much action) to nickel ammonium sulphate baths darkens the deposits, even when pure anodes are used, but this darkening is much less pronounced than when impure anodes are used. The less ammonium, *i. e.*, the greater the proportion of nickel sulphate to nickel ammonium sulphate the less the darkening action of these salts. In the single salt baths containing no ammonium the darkening practically ceases.

[4]Sperry, Brass World, Oct., 1905.

Other Salts than Sulphates.

Nickel sulphate and ammonium perchlorate in the proportion of nickel and ammonium in nickel ammonium sulphate gave deposits that were not different from those produced in nickel ammonium sulphate baths.

Nickel chloride and ammonium chloride gave deposits that were less bright than from the corresponding sulphate baths. Lead hooks as hangers for anodes were attacked in these chloride baths.

COMPOSITION OF BATHS USED.

(a). *Nickel Ammonium Sulphate or "Double Salt."*

This is the best known plating salt, but is poorly adapted for this use on account of its low solubility, which limits the concentration to 8 per cent for winter use and 10 per cent for summer use. This bath gives a good deposit at a low current (0.3 amp. per sq. dec. or 2.8 amp. per sq. ft.), but with higher currents gas is evolved at the cathode, and the deposit becomes black or pulverulent or "burned." Additions of magnesium sulphate magnesium chloride, potassium chloride, sodium sulphate, ammonium chloride, ammonium bromide or sodium, potassium or ammonium citrates, tartrates or acetates from 1 to 8 per cent decreased the current that could be used without producing the blacking or burning. When a low enough current was used to avoid the burning, the whitening action of the magnesium and the darkening action of the other salts were observed. Boric acid was the only substance which seemed to prevent the burning of the deposit at high currents. With 5 per cent boric acid it was possible to get a deposit only slightly burned on the upper edge with a current of 2 amp. per sq. dec. The addition of boric acid along with the salts mentioned above tended to overcome the blackening and allowed a higher current to be used, but not as high a current as when the salts were absent.

(b). *Nickel Sulphate and Nickel Ammonium Sulphate Bath.*

An 8 per cent nickel ammonium sulphate bath contains only

about 1.4 per cent of nickel, a metallic content entirely too low for rapid work. With each addition of nickel sulphate to the 8 per cent nickel ammonium sulphate bath, a higher current could be used without causing blackening, and less boric acid was required to prevent the burning or blackening with a given current. It was found that 2 amp. produced no blackening even upon the edges if 5.3 per cent nickel sulphate and 1 per cent boric acid were added. With 8 per cent nickel sulphate, still less boric acid (0.3 per cent) was required to prevent burning. A bath containing 7 per cent nickel ammonium sulphate, 7 per cent nickel sulphate, 1 per cent boric acid and 0.2-0.3 per cent ammonium citrate was found suitable for electrolysis with the high current of 1.6 amp. per sq. dec. The effects of the various salts were then tried in this bath. An increase in the boric acid to 2 and then to 3 per cent seemed not to affect the deposit except to make it more lustrous before buffing. This is, in general, the effect of increasing the acidity of the bath. Magnesium sulphate, 5, 6, and 11 per cent, had no darkening action, but seemed to make the deposit whiter after buffing. Sodium chloride sodium sulphate or potassium chloride, 5, 6, and 11 per cent, made the deposits increasingly darker before buffing, and more bluish after buffing. It seems that the proportion of ammonium in nickel ammonium sulphate is near the limit for pure white deposits with ferronickel anodes because a decrease in the ratio of ammonium, by adding nickel sulphate, makes the deposits brighter and makes the darkening action of the sodium less pronounced. It seems that when the sum of the sodium and the ammonium reaches a certain point in proportion to the nickel, the deposit begins to lose its pure white color. The less the ammonium in the bath, the greater the quantity of sodium required to produce the darkening. On the other hand, the ammonium and the magnesium are not additive, hence large quantities of magnesium in baths containing ammonium do not produce a darkening. Ammonium shows a greater tendency to produce the darkening than does the sodium. With pure anodes the darkening action was very much less noticeable, thus showing the injurious influence of the impurity, iron. Boric acid will overcome this darkening action, but with very large quantities (15 per cent) many of the deposits became covered with fine cracks. Salt which is added only on account of the better anode corrosion, due to the chloride, should be replaced by magnesium chloride, which accomplishes the same results as both the sodium and chloride and the magnesium sulphate without the injurious effect of the sodium.

(c). *Baths with Large Amounts of Nickel Sulphate.*

With only 4 per cent nickel ammonium sulphate, 1 per cent boric acid, 0.2 per cent ammonium citrate and with nickel sulphate from 8 per cent increasing to 16, the deposits became more and more lustrous before buffing, and the darkening effect of the alkali metal salts became much less pronounced. This bath has the advantage over baths having a greater proportion of nickel ammonium sulphate, like (b), that the additions of other salts have less influence upon the color of the deposit and over single salt baths, like

(d), that its slight acidity need not be so carefully maintained. This bath seemed to give the best deposits of any that was tried.

(d) *Single Salt Baths.*

Some experiments were tried with the following single salt bath, which is being used commercially except for the ammonium citrate: nickel sulphate 10.5 per cent, boric acid 3.7 per cent, sodium chloride 1.8 per cent and ammonium citrate 0.2 per cent. The deposits were bright and white after buffing and sodium chloride up to 11 per cent and ammonium citrate up to 3.5 per cent produced only a little darkening. With pure anodes the darkening was still less.

CONCLUSIONS AND SUMMARY.

1. The purest nickel anodes obtainable should be used. Strips of electrolytic nickel cathodes, 98.8 per cent pure, used directly as anodes, dissolve irregularly and with pitting, but no impurities are introduced into the bath. Very much of the trouble with badly colored deposits and with sludge is caused by the iron from impure anodes.

2. The addition of 2 per cent of magnesium or nickel chloride makes the anode corrosion approximately theoretical.

3. The nickel anodes, supported by lead hooks, may be completely immersed in the solution, thereby greatly reducing the amount of scrap metal from the anodes.

4. The anodes should be placed in bags in order to catch loosened particles which cause pitting if they reach the cathode.

5. The addition of 0.2 to 0.3 per cent of ammonium citrate keeps the solution clear and free from sludge, whereby a more shallow tank and a less volume of solution may be used.

6. The bath should be stirred or mixed thoroughly at intervals, but not within 8 to 10 hours of the time of using, if any solid particles from the anodes are present.

7. The greater the ratio of nickel sulphate to nickel ammonium sulphate, the brighter and more shiny the deposit. The more acid the solution (to the point of acidity to Congo red), the more shiny the deposits.

8. Boric acid increases the current that can be used without blackening or burning the deposit.

9. The following bath seemed to be the best: nickel ammonium sulphate 4 per cent, nickel sulphate 10 to 14 per cent, boric acid 1 to 3 per cent, magnesium chloride 2 per cent and ammonium citrate 0.2 to 0.3 per cent.

10. A current density of 1.6 amp. per sq. dec. (14.8 amp. per sq. ft.) which plates a thickness of 0.0025 cm. (0.001 in.) in 1.25 hours may be used.

The authors wish to thank the American Electrochemical Society and its Committee on Assisted Research for the grant of money for the purchase of a portion of the materials used in this research.

Indiana University, Bloomington.

[*Written discussion of this paper is invited, and may be sent to the Secretary, Jos. W. Richards, South Bethlehem, Pa., or read at the meeting.*]

CALCIUM CHLORIDE IN NICKEL SOLUTIONS.

(Some points pertaining to Mr. Miller's suggestion in the March Issue.)

By G. S. Robins, St. Louis Branch.

I have read with interest the suggestion of Mr. B. E. Miller, the secretary of the Detroit Branch, in the last issue regarding the use of calcium chloride in nickel solutions. Perhaps some of the points of chemistry involved will explain the questions which Mr. Miller has put, and also show the theoretical value of calcium chloride in the nickel solution.

When calcium chloride is introduced into the nickel bath, a precipitate is formed, according to the following reaction: calcium chloride+nickel sulphate=calcium sulphate+nickel chloride.

This reaction is almost quantitative, since calcium chloride is only soluble to the extent of 0.18 parts in 100 parts of water. This precipitate falls to the bottom of the bath in time to gather with another precipitate, *i. e.*, calcium borate (provided there is boric acid in the nickel bath). There will be included in this precipitate mechanically some nickel sulphate. The scum on top of the bath is due undoubtedly to impurities in the calcium chloride, which, at its very best, is a crude proposition (with the exception of the refined and chemically pure article).

Looking at the reason for introducing the calcium chloride in the first place, we find that there could be no other than as a conducting salt. Now the calcium chloride changes over into the form of the insoluble sulphate the minute it is placed in the bath. The excess of nickel sulphate in the bath will, of course, still keep the bath in a working condition, and the amount of nickel chloride formed will act as a conducting agent and give good results. Our poetic editor, Lord Tennyson Richards, and I made a considerable number of experiments last summer in an effort to determine the best formula for a single nickel salt bath, and found that nickel chloride produced excellent results as a conducting agent. Mr. Richards has been very delinquent in tabulating the results of these experiments for the Review, but now that the spring is coming, we may look forward to seeing them in poetic rhythm at any moment, and then everybody can join in the chorus. Nevertheless, nickel chloride is an admirable conductor in nickel solutions, but it is expensive as compared with sodium or ammonium chlorides.

I cannot see where the calcium sulphate formed has any conducting powers whatsoever, since it is no longer in solution, and we know that for a substance to be a conductor, it must be in solution, and readily decomposable, electrolytically. The fact that the Saginaw Calcium Company's calcium chloride works better than others in this respect is probably due to the fact that it contains about 16% of magnesium chloride, which has good conducting powers, and forms no precipitate in the nickel bath. The results obtained by Mr. Miller are in all probability due to the conductivity of magnesium chloride, together with that of the small amount of nickel chloride formed.

It's the metal that tells the story—that is the enlightened way of dealing with any electro-plating bath. And the simpler the bath is, the easier it is to handle. In my opinion the calcium chloride has no advantage whatsoever, and on the other hand, a serious disadvantage, since it loads up the bath with an unnecessary precipitate, precipitates out the boric acid, wastes nickel solution, which is taken up mechanically in the precipitation, and introduces dirt and other impurities into the bath. What is wanted in the nickel bath is a soluble chloride or sulphate of a metal which will conduct quickly and give a bright deposit. In the class of good conducting salts might be mentioned sodium chloride, ammonium chloride, magnesium chloride, nickel chloride, and magnesium sulphate, sodium sulphate and ammonium sulphate.

Avoid the precipitates!

We sadly admit it; we have been remiss in the tabulation of those experiments for publication; our only excuse is that so far we didn't find a solution that was perfect; we are still seeking perfection, but so far it eludes us.—Ed.

"LOYALTY."

If you work for a man, in Heaven's name WORK FOR HIM. If he pays you wages that supply your bread and butter, work for him; speak well of him; stand by him and stand by the institution he represents. If put to a pinch *AN OUNCE OF LOYALTY IS WORTH A POUND OF CLEVERNESS.* If you must vilify, condemn and eternally disparage, why, RESIGN YOUR POSITION, and when you are outside, damn to your heart's content. But as long as you are a part of the institution, do not condemn it. If you do you are loosening the tendrils that hold you to the institution, and you will be uprooted and blown away in the blizzard's track, and probably you will never know why.

SULPHURIC ACID IN HOT COPPER SOLUTION AS ONE OF FORD'S PLATERS RELATED.

At our last meeting Mr. Ford's plater said he made a solution by taking copper cyanide, sodium chloride and cyanide with the additions of potash by which he got good results, but potash being a scarce article at the present time, he started to use caustic soda and that gave him good results for awhile, but at last the solution went bad, in which case the addition of cyanide of metal to the solution would not give results, so he got desperate and made an addition of one-half pail of sulphuric acid to a 450 gallon solution and he claims that by so doing it cleaned up the anodes and it produced the prettiest copper plate he ever saw. After the addition of acid he also added Wyandotte yellow hoop which he called soda ash. It remains for the Wyandotte company to say whether it is soda ash or not; however, their representative says the laundries are using it for washing.

B. E. Miller, Secretary.

GOOD NEWS FROM PROVIDENCE, R. I.

Mr. H. J. Richards.

Dear Sir: I have the pleasure to inform you that, on the 19th of March I invited the electro-platers of this city to meet at the Eagles' Home, No. 830 Westminster Street, to organize a Branch of the A. E. S. in Providence.

The meeting was called to order at 4 o'clock, Mr. Hugh McGinniss was elected pro-chairman, and I then explained, in a short address, the object of the Society, and the advantage for the electro-platers to organize the same here. Mr. Alfr.d Senecal then read the constitution, adding a few remarks now and then. Mr. Albert Pepin also made a few remarks in favor of the movement, and after having taken a vote on the matter, the officers were elected in the following order:

President—Mr. Alfred Senecal.
Vice-President—Mr. Hugh McGinniss.
Secretary—Mr. Albert J. Lemrise.
Treasurer—Mr. Albert M. Pepin.
Board of Managers—Mr. Louis Poirier, Mr. Andrew McQueeney and Mr. L. G. Galarnean.
Librarian—Mr. Arthur W. Wood.
Sergeant-at-Arms—Mr. John Douglas.

The other members were Mr. Joseph Bessette, Mr. Horace Achin, Mr. John H. Andrews, Mr. Joseph Rogovus.

I was then requested to apply for a charter. A committee was named to select a more suitable location to meet, and after a short, friendly talk, the meeting adjourned to April 2.

The second meeting was held at No. 60 Waybossett street. It was opened by the President, and on account of the members having to fill out their applications, the reading of the minutes was postponed to the next meeting. Correspondence from the Supreme Secretary, stating that a temporary charter had been granted us and same was on its way, was imparted to the members also much necessary information about the A. E. S. Three new applications for membership were presented to the Board. Kindly receive same for admission. Mr. William Parks, Jr., for active membership, Messrs. Elmer K. Morgan and G. J. Tyndall for associate membership. Mr. William Parks has been six years foreman electro-plater with Wolcott Mfg. Co., No. 71 Peck street, Providence. Mr. Elmer K. Morgan has been many years salesman for Geo. L. Claflin, Wholesale Druggist, No. 70 North Main street, and Mr. Tyndall, traveling salesman for the same firm, both well known and worthy of membership.

All the members showed their interest in the Society by taking application blanks to do canvassing for new members.

It was also voted that the members shall pay monthly dues of 50c until June 1st, at which time to decide upon the matter. A vote of thanks was given the Secretary who presented the President with a gavel. It was next decided to hold two meetings a month, the 1st and 3rd Wednesdays of each month at 7:45 p. m. Mr. E. S. Thompson's address before the Indianapolis

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"LOYALTY."

If you work for a man, in Heaven's name WORK FOR HIM. If he pays you wages that supply your bread and butter, work for him; speak well of him; stand by him and stand by the institution he represents. If put to a pinch *AN OUNCE OF LOYALTY IS WORTH A POUND OF CLEVERNESS.* If you must vilify, condemn and eternally disparage, why, RESIGN YOUR POSITION, and when you are outside, damn to your heart's content. But as long as you are a part of the institution, do not condemn it. If you do you are loosening the tendrils that hold you to the institution, and you will be uprooted and blown away in the blizzard's track, and probably you will never know why.

SULPHURIC ACID IN HOT COPPER SOLUTION AS ONE OF FORD'S PLATERS RELATED.

At our last meeting Mr. Ford's plater said he made a solution by taking copper cyanide, sodium chloride and cyanide with the additions of potash by which he got good results, but potash being a scarce article at the present time, he started to use caustic soda and that gave him good results for awhile, but at last the solution went bad, in which case the addition of cyanide of metal to the solution would not give results, so he got desperate and made an addition of one-half pail of sulphuric acid to a 450 gallon solution and he claims that by so doing it cleaned up the anodes and it produced the prettiest copper plate he ever saw. After the addition of acid he also added Wyandotte yellow hoop which he called soda ash. It remains for the Wyandotte company to say whether it is soda ash or not; however, their representative says the laundries are using it for washing.

B. E. MILLER, Secretary.

GOOD NEWS FROM PROVIDENCE, R. I.

Mr. H. J. Richards.

Dear Sir: I have the pleasure to inform you that, on the 19th of March I invited the electro-platers of this city to meet at the Eagles' Home, No. 830 Westminster Street, to organize a Branch of the A. E. S. in Providence.

The meeting was called to order at 4 o'clock, Mr. Hugh McGinniss was elected pro-chairman, and I then explained, in a short address, the object of the Society, and the advantage for the electro-platers to organize the same here. Mr. Alfr.d Senecal then read the constitution, adding a few remarks now and then. Mr. Albert Pepin also made a few remarks in favor of the movement, and after having taken a vote on the matter, the officers were elected in the following order:

President—Mr. Alfred Senecal.
Vice-President—Mr. Hugh McGinniss.
Secretary—Mr. Albert J. Lemrise.
Treasurer—Mr. Albert M. Pepin.
Board of Managers—Mr. Louis Poirier, Mr. Andrew McQueeney and Mr. L. G. Galarnean.
Librarian—Mr. Arthur W. Wood.
Sergeant-at-Arms—Mr. John Douglas.

The other members were Mr. Joseph Bessette, Mr. Horace Achin, Mr. John H. Andrews, Mr. Joseph Rogovus.

I was then requested to apply for a charter. A committee was named to select a more suitable location to meet, and after a short, friendly talk, the meeting adjourned to April 2.

The second meeting was held at No. 60 Waybossett street. It was opened by the President, and on account of the members having to fill out their applications, the reading of the minutes was postponed to the next meeting. Correspondence from the Supreme Secretary, stating that a temporary charter had been granted us and same was on its way, was imparted to the members also much necessary information about the A. E. S. Three new applications for membership were presented to the Board. Kindly receive same for admission. Mr. William Parks, Jr., for active membership, Messrs. Elmer K. Morgan and G. J. Tyndall for associate membership. Mr. William Parks has been six years foreman electro-plater with Wolcott Mfg. Co., No. 71 Peck street, Providence. Mr. Elmer K. Morgan has been many years salesman for Geo. L. Claflin, Wholesale Druggist, No. 70 North Main street, and Mr. Tyndall, traveling salesman for the same firm, both well known and worthy of membership.

All the members showed their interest in the Society by taking application blanks to do canvassing for new members.

It was also voted that the members shall pay monthly dues of 50c until June 1st, at which time to decide upon the matter. A vote of thanks was given the Secretary who presented the President with a gavel. It was next decided to hold two meetings a month, the 1st and 3rd Wednesdays of each month at 7:45 p. m. Mr. E. S. Thompson's address before the Indianapolis

Branch of A. E. S. was next read. The members were deeply interested in it. The meeting then adjourned to April 19.

Now, Mr. Editor, I am pleased to state that the Providence members are full of enthusiasm, but to progress I feel that it will be necessary to keep them interested. If you have any literature on subjects of interest to them, or any advice or information to keep them interested, I would be very grateful for all that I can get. I worked hard to organize this Branch, and I am positive that, with the proper management, we can have a Branch of two or three hundred members here. Kindly consider the matter, and favor us with your valuable co-operation.

Kindly notify us as soon as those three new members are elected.

Hoping to hear from you soon, I am

Very respectfully yours,

ALBERT J. LEMRISE,
Secretary,
No. 124 Waverly Street, Providence, R. I.

As we stated in our answer by mail, we are yours to command in any and every way, and heartily wish success to Providence Branch.—Ed.

THE BOOSTER.

The booster is the party
  Who is hauling down the dough,
The folks are glad to grab his mitt
  Wh rever he may go.
He's the little bit of sunshine,
  He's the Johnny on the spot,
And his talk is mighty welcome,
  Though it strains the truth a lot.
There's a sort of benediction
  In his cheerful "Howdy do,"
And he makes you life worth living
  While he's round a jokin' you.
The knocker is the person
  Who's the sorriest of chumps,
He has a face twelve inches long,
  He's always in the dumps.
When people see him coming
  They walk round a city block,
So they needn't stand and listen
  To this stone age fossil knock;
He's a burden to his country,
  He is no good to himself,
And his victims shout thanksgiving
  When he's laid upon the shelf.

It is a good night's rest when a man retires a pessimist and arises an optimist.

QUESTIONS AND ANSWERS.

Question: What is the best protective coating for iron or steel so the articles will not rust in salt air (using a solution)?

Answer: Zinc solution, or 15 min. cyanide, 45 min. duplex.

Question: Give me a formula for crystal green on copper or brass.

Answer: Any verde bronze solution will crystal the article, or use one teaspoon of acetate of copper and a piece of liver of sulphur the size of a pea, in one quart of hot water.

Question: Which nickel plate is most flexible, the solution that is run below neutral point (alkaline) or one that is run beyond the neutral point (slight acid)?

Answer: Slightly acid solution gives best results; deposits a finer grain, depending on the correct current conditions.

Question: What heat will black nickel plated articles stand to give best results with either an excess of nickel or zinc in solution?

Answer: Heat will have no effect on the deposit with either an excess of nickel or zinc in solution, if your deposit is right.

Question: Kindly give me the best method for cleaning sand stains or other discolorations from the inside of an aluminum tea-kettle, etc.

Answer: Dip in hot potash (prefer new solution) for a few minutes, then clean water, and pickel in hydrofluoric acid, 20 to 1 —1 part of acid to 20 of water—then in clean water, and then run through concentrated nitric acid, and dry in sawdust, or use oxalic acid pickel for cleaning stains.

Question: Give me a method that I can obtain a silver-green finish, so the high lights will show silver and the background green.

Answer: Use a weak solution of potassium sulphuret, or use hyposulphite of soda two parts, oxide of lead one part, in boiling water, or take a teaspoon of acetate of copper and a small piece of liver of sulphur the size of a pea, in one quart of water (use hot).

Question: What is the most economical solution to run the single salts or double salt solution?

Answer: We would like some criticism from the various members on this subject; some say the single salt, and some say double salt. Which gives the best anode efficiency?

Question: My boss has a continual grouch on and never comes into my department except to knock about my work. What can I do?

Answer: The next time he comes into the plating room, hit him over the head with a piece of lead pipe, this *will keep him out.*

Question: My polishers are always kicking about the castings being hard, and the glue no good. What would you advise?

Answer: Talk gently and kindly to them, remember that polishers are human, though prone to look on the gloomy side of life. Cheer them up with appropriate quotations from James Whitcomb Riley and Ella Wheeler Wilcox; this will uplift and elevate them and direct their minds in more cheerful channels.

PETTY TROUBLES AND THEIR ELIMINATION IN THE PLATING ROOM.

By F. H. Farmer, Cincinnati Branch.

I believe there has been more worry and gray hairs among the platers from petty annoyances in the plating room than from the care of solutions themselves, and the purpose of this article is to show my method of overcoming some of them.

If this article appeals to you and you have something as good or better, I believe our very able editor, and the membership at large will appreciate it, so don't hesitate, send it in.

To overcome leaking tanks: I have placed the tank within a tank, after drawing up all the bolts, filled in all around with hot pitch and then set the whole in a solid concrete base far enough to cover the seams where the sides and bottom join. The advantage of this tank is: you can heat any solution without the lining running to the bottom. There being no lining in the containing tank it is easier to recover work dropped, because bottom is smooth. Tanks can be used to hold acid copper or any other solution, as they are practically indestructible; mine have been in use for six years and show no sign of deteriorating.

Leaking waste pipes is another annoyance; this is especially so where plating room is situated on any other than the ground floor, as leaking water, or solutions often times splatter on work in one state or another in the process of assembling or on finished stock. I have seen iron, brass, lead and sewer pipe used for this purpose, and at one time or another they were bound to give way.

The best I've ever heard of, and one that is giving complete satisfaction, runs from the fifth floor to the cellar. It is composed of sewer pipe encased in wood frame, and is filled in all around with concrete. This pipe has been in service in one of Cincinnati's largest plating rooms for the past three years and has never given any trouble since the installation. I will adopt this method of piping just as soon as the one I have at present gives out.

Valve leakage: This is of frequent occurrence, and no matter whether it is due to the use of a cheap valve or improper piping, which causes water hammer, and pounds the valve to pieces, or whether it is just worn from long service, the result is the same. Ive tank empty in the morning; or a hole developing in the coil of your cyanide copper over night, coupled with the fact that your drain was left open, means cyanide copper overflowed and was all over the room. The easiest way to stop this leakage is with a horizontal check valve of the regrinding type placed between the tank and the entering valve. Check valves are usually short lived, owing to the ceaseless pounding they are subjected to: so by installing the regrinding type you can in a few minutes take apart, regrind, and replace; your valve is as good as new again.

A plater working in soft metals and using iron tanks for hot and cold water, would do well to place about four inches of clean white sand on bottom of tank. If work falls from rack or there is wire breakage, it will not become nicked or marred from contact

with the iron bottom; of course, this applies to moderately heavy work.

Where you work from end of tanks instead of from the sides, and the hydrant cock is in the rear end, also the overflow, it is a good plan to connect hose to cock, thereby letting the water strike the forward end of tank, giving a backward flow, insuring fresh, clean water at all times where the work enters the tank. Because of the force behind it this method carries off all foreign matter immediately upon immersion. If the tank is more than two feet wide, a spreader in the form of a paddle can be inserted in the end of hose.

It is a good plan to strip nickel racks at least once a month, using either the acid dip or the electric strip. Once a week is far better, as the nickel is more easily and more rapidly removed and leaves the rack in better condition.

In order to insure maximum results with your racks, don't use them unless in perfect condition. Whenever one or more prongs are broken, you lessen your output just that much in each batch of work.

Never use baskets that cannot hold its full quota of work, for the same reason.

If you are using crocks for acids, dips, etc., have baskets made round; mine just fit the crocks, and I handle more work in a given time by so doing. For baskets always use the largest mesh possible; water, acids, etc., run off more easily, which means a considerable saving in acid each year.

Screening for baskets, solution skimmers, and wire for rack hooks, I always have cut ahead, and I can make a new basket, a new rack to hold eighty-four pieces the size of a silver dollar, and a solution skimmer, all in forty-five minutes by this method.

For the solution skimmer I use the old frames over, and over. The frame has twelve perforations for screws, and I use a one-fourth-inch wire halved and bent to conform to shape of skimmer; this also has the twelve holes. To renew the old screening all that is necessary is to remove twelve screws, place in position new screening and tighten screws again.

I have saved current and nickel by using adhesive tape on the frame-work of some of my nickel racks. This tape was wrapped and cord-bound where it started and corded where it finished, then given three coats of heavy gum lacquer; these racks are good for one year's service before tape needed renewing.

Five minutues' time morning and noon when starting your dynamo will save many troubles during the day. By gently rubbing your commutator with a fine sandpaper, applying a good vaseline instead of a generator compound, and using the air hose where practicable, to free all parts from dust accumulations, you will be saved the annoyance of shut-downs and commutator troubles due to arking.

"For everything that happens,
You've but to look to find
There's bound to be a reason,
So keep that fact in mind."

ELECTROLYTES.

By The Editor.

Electrolytes are plating solutions. They are combinations or mixtures of divers chemicals. Often they are too diverse. The simpler the formula, the better the electrolyte. Mixtures are pitfalls, and combinations should be shunned. They generally go wrong, no matter how carefully you shoot. Electrolytes are great alibi furnishers, for any fault in the deposit, the solution is blamed. Often the diagnosis is wrong and the electrolyte is made sick by being dosed with medicine that it did not need, and therefore cannot assimilate. Prevention is better than doping, so rinse the cathode first, last and all the time, and don't spare the anodes.

Water distilled to absolute purity is a non-conductor, therefore, water is only a vessel to hold the necessary electrolytical ingredients. Suppose we take one gallon of water with say one pound of cyanide dissolved in it, we put in anode and cathode and turn on the current; of course, we get no deposit; we have good conductivity, but no metallic contents. We add copper in suitable form and soon get a serviceable deposit. Again take one gallon of water and dissolve in it one pound of mineral sulphate, put in anode and cathode and try to plate; you again get no results. But now the shoe is on the other foot—we now have good metallic contents but poor conductivity. The addition of suitable conducting salts again permits the deposition of metal on the cathode. Therefore, the solution must possess conductivity and metallic contents. Look upon every ingredient with suspicion and make it prove its usefulness by actual working tests.

THE AMERICAN ELECTRO-PLATERS' SOCIETY.

A society was formed of brotherly love,
A society great and good;
Where all might profit, and none might lose,
As all societies should.
A company formed by mutual needs,
By bonds of a common desire.
To collectively profit by mutual help,
And in well-doing never to tire.
Excelsior is our motto and aim,
To ever and ever improve;
For the man who tried to go it alone
Is certain to get in a groove.
A band of platers this company is,
And we seek to advance our art,
To experiment, study, progress, and learn,
To the end of each year, from the start
Don't get discouraged, down hearted, or blue,
And never admit defeat,
For if we all pull, and pull one way,
We just simply can't be beat.
So help the good cause and share the work
Our advance will be steady and true;
Don't stay in the darkness, but make your light shine
In the Platers' Monthly Review.

WHAT THE BRANCHES ARE DOING

NOTICE.

Owing to the uncertain conditions prevailing in Canada, on account of the war, the question concerning the advisability of holding the 1916 Convention in Toronto, has been seriously considered by the Supreme Society.

To clear the situation, the Toronto Branch, having the best interests of the Society foremost, has relinquished the honor of being the host of the Society next July, and has so informed the Supreme Secretary. The decision as to where the 1916 Convention shall be held will be made by the Executive Board in time for publication in the May issue of the Review.

CLEVELAND BRANCH.

Meets once a month at American House.

Secretary: CHARLES WERFT, 1341 East 112th St., Cleveland.

At our meeting on March 25th, although the weather was bad, we had an enthusiastic meeting, and made a start toward securing a laboratory, having now $39.00 toward the fund necessary, and we now look forward to accomplish what we have long hoped for.

Three new members were added to our roster. After June 1st, we will charge an additional application fee, same to go to laboratory fund.

ST. LOUIS BRANCH.

Meets fourth Saturday of each month at Public Library Assembly Rooms. Secretary, F. C. Rushton, 4405 Blair Avenue, St Louis, Mo.

Our meeting held on March 25th, while not largely attended, was very interesting. S. J. Richards, in an informal way, told of experiments with different conducting salts in single nickel salt solutions.

It was decided to hold our April meeting on the 15th, which will begin at 6 p. m. with a dinner, then a brief meeting will be held in one of the parlors of the Laclede Hotel, after which we will attend the Columbia.

NEW YORK BRANCH.

Meets second and fourth Friday of each month at 258 Pearl Street, New York City, 8 p. m. Secretary, Wm. Fischer, 345 East 23rd Street, New York City.

The regular monthly meeting of the New York Branch was held Friday evening, March 24th. After the regular order of

business, a discussion on the single nickel salt solution was enjoyed, and some samples shown, plated in solutions with various conducting salts. The advantage of the cyanide copper solution over the acid copper solution was discussed, and it has been proven that the advantages are many, and the efficiency of the cyanide solution is as high as the acid solution.

The New York Branch is looking for more suitable quarters to meet in, and will vacate their present meeting rooms on the first of May.

Two applicants were elected to active membership.

An interesting discussion on the relative value of sodium and potassium compounds, and opinions differed very much; some claimed that they could not notice any difference, and others were equally sure that potassium compounds were superior to sodium compounds. The subject for our next meeting will be single nickel salts solution.

DAYTON BRANCH.

Meets first Wednesday of each month at the Y. M. C. A., Dayton, Ohio. Secretary, Alphonz Lamourcux, 500 East First Street. Dayton, Ohio.

The regular April meeting of Dayton Branch was held on Wednesday, April 5, with a good number present. After disposing of the regular order of business, the meeting was turned over to President Fraine, who addressed us on the subject of shop organization, beginning with the formation of the company, and working up to the successful operation of the factory proper, showing, by the aid of charts and drawings, the good that can be accomplished by perfect organization and harmony between the heads of the concern and the various heads of departments. Mr. Fraine dwelt quite at length upon standardization, specialization, and duplication, which will be the rule in all good and successful concerns in the future. Mr. Fraine's talk was very much enjoyed by the large number present, and showed very clearly that the speaker was thoroughly conversant with his subject. Dayton Branch is going to have some very interesting meetings in the future, as we have several good speakers to address us.

MILWAUKEE.

Meets first Friday of each month at West Side Bank Building, Third and Chestnut Streets. Secretary, E. C. Yaeger, 962 Ninth Street. Milwaukee, Wis.

At our last meeting the Branch had the nomination of officers, who will be elected at the next meeting, in May. We also elected Stephen Verfurth, employed at Chas. Polechech, Bro. & Co., as active member of this Branch. The meeting was well attended.

PHILADELPHIA BRANCH.

Meets first Friday of each month in the Harrison Laboratory Building, University of Pennsylvania, 34th and Spruce Streets Secretary, Philip Uhl, 2432 North 29th Street, Philadelphia.

The regular monthly meeting of Philadelphia Branch was held on Friday, April 7th, at which there was a good attendance of members, who took a keen interest in the business of the evening.

The consensus of opinion of the members of this Branch is that the paper read by Walter Fraine (Some Experiences With Shot Nickel Anodes, published August, 1915) was the best read.

Mr. J. L. Dinan, of the Zapon Lacquer Co., gave an informal talk, Enamel Mahogany Finish on Casket Plates.

PROVIDENCE BRANCH.

Albert J. Semrise, Secretary, 124 Waverly St., Providence, R. I.

We extend greetings and hearty welcome to our new Branch, which, during the past month, has received, and is at work under, a temporary charter.

A letter published on another page gives details of its auspicious beginning, and we assure the officers and members of our desire to be of service.

BRIDGEPORT.

Meets third Friday of each month at the office of the Brass World, 260 John Street, Bridgeport, Conn. Secretary, Nelson Barnard, 858 Howard Ave., Bridgeport, Conn.

The third annual banquet of this Branch was held at the Hotel Stratfield on Saturday, March 25th. More than 100 members and their friends were present, and a very enjoyable and profitable evening was spent. The speakers were W. R. Webster, Dr. F. C. Stanley, Chas. H. Proctor and Geo. B. Hogaboom.

INDIANAPOLIS BRANCH.

Meets second Saturday of each month at Hotel Dennison. Secretary, Louis Mertz, 1725 Union Street, Indianapolis, Ind.

Indianapolis Branch held its meeting April 8th, President Aufderheide presiding.

The attendance was not very good, as the weather was bad.

It was decided that we secure some copies of the address of O. E. Servis—published in January Review—to send to the employers of Indianapolis.

Mr. F. Liscomb was with us, and delivered a talk on chemistry in the Branch, which was considered very instructive.

CHICAGO.

Meets fourth Saturday of each month, 8 p. m., Western Building, Randolph Street and Michigan Avenue. Secretary, H. E Willmore, 5911 South Boulevard, Chicago, Ill.

The regular monthly meeting was held March 25th, with Oscar E. Servis presiding.

The establishment of a chemcial laboratory was again discussed, and several members reported that their employers would contribute toward its installation.

The matter of awarding a trophy for the best paper read at the Dayton convention was discussed, and it was the sense of the members of this branch that the paper presented by Mr. Walter Barrows on the "Commercial Aspects of Electro-Plating With Cobalt" was entitled to the award as being the most valuable contribution to the art of electro-plating.

A discussion was also had on the admission of assistant foremen platers into membership of the Society. It was indicated that the decision of the Supreme President to allow the amendment to stand as adopted at the Dayton convention did not represent the wishes of a majority of the members, and that the decision had been r ndered, not on a referendum vote of the members of the Society, but on a collective vote of the Branches, which did not represent the wishes of a majority of the members, as the vote should have done.

NEWARK BRANCH.

Meets first and third Friday of each month, 8 p. m., 47 Bank Street, Newark, N. J. Secretary, Geo. Reuter, Jr., 333 S. 19th Street, Newark, N. J.

TORONTO BRANCH.

Meets fourth Tuesday of each month at Occident Hall. Bathurst and Queen Streets. Secretary, Ernest Coles, P. O. Box 5, Coleman P. O., Toronto, Ont.

DETROIT.

Meets first Tuesday of each month at 26 East Congress Street. Secretary, B. E. Miller, 543 Townsend Avenue, Detroit, Mich.

CINCINNATI.

Meets once each month at Dennison Hotel, Cincinnati, Ohio. Secretary, F. H. Nordmann, 720 Froom Ave., Cincinnati, Ohio.

TOLEDO.

Meets the last Tuesday of each month at Toledo University. Secretary, James E. Nagle, 209 Navarre Ave., Toledo, Ohio.

ROCHESTER.

Meets second and fourth Friday of each month at University of Rochester. Secretary, C. V. Haring, 603 Dewey Avenue, Rochester, N. Y.

BUFFALO.

Meets first Saturday of each month at the University of Buffalo, 8 p. m. Secretary, John G. Murphy, 71 Dingens St., Buffalo, N. Y.

ELECTED TO MEMBERSHIP.

NEW YORK BRANCH.

Mr. Fred Hauschalter.....82 Hull St., Brooklyn, N. Y.
Mr. Leo. P. McDermott.....20 Hinman St., Meridan, Conn.

CLEVELAND BRANCH.

Mr. Wm. B. Pleadwell.....2191 E. 69th St., Cleveland, O.
Mr. Wm. Ramerman.....6511 Mona Ave., Cleveland, O.
Mr. B. F. McCormick.....7107 Colgate Ave., Cleveland, O.

ST. LOUIS BRANCH.

Mr. Geo. Marsh.....Belleville, Ill.

CHICAGO BRANCH.

Mr. Arthur Stringer.....16 E. 118th St., Chicago
Mr. Herman Hoenchaid.....Peru, Ill.
Mr. Frank Pankau.....4111 Dickens Ave., Chicago
Mr. Robert Meyers.....1116 Sill Ave., Chicago

INDIANAPOLIS BRANCH.

Mr. Wm. Wright.....507 Riverside Ave., Muncie, Ind.
Mr. Gus J. Loechle.....628 N. Noble St., Indianapolis, Ind.

DETROIT BRANCH.

Mr. Wm. W. Ream.....825 Elizabeth St., Flint, Mich.

BRIDGEPORT BRANCH.

Mr. Victor H. Borg.....260 John St., Bridgeport, Conn.

Change of address, J. A. Wilkinson, 5241 Addison St., Philadelphia; J. Dorricott, 8200 Buist St., Philadelphia.

APPLICATIONS FOR MEMBERSHIP.

Application to membership, C. E. Brubaker, Columbia, Pa.

CHICAGO BRANCH.

Mr. John T. Satka.....1602 S. Wood St., Chicago

INDIANAPOLIS BRANCH.

Mr. Frank E. Thompson.....1427 Shelby St., Indianapolis, Ind.

NEWARK BRANCH.

Mr. Walter J. Shaw.....489 S. Belmont Ave., Newark, N. J.
Mr. John B. Cinq Mars.....12 Pacific St., Newark, N. J.

CLEVELAND BRANCH.

Mr. Geo. P. Walsh.....4141 E. 98th St., Cleveland, O.

MILWAUKEE BRANCH.

Mr. Stephen Verfuth.....1336 Richard St., Milwaukee, Wis.

SPECIAL NOTICE.

There appears to be a misunderstanding and possibly a misconstruction of our laws governing the control and disposal of papers read before the branch societies of the A. E. S. We believe the Monthly Review has been deprived of several valuable papers because of this misunderstanding, hence we are calling your attention to the matter, trusting you will give it your sincere attention.

Certainly we do not desire to monopolize the efforts of our members and our constitution does not specifically cover the control or disposal of all papers written by our members, to the exclusion of trade publications. Naturally, such a ruling would be ridiculous. But when a paper is read at a meeting or banquet of any Branch Society of the A. E. S., then the paper becomes the property of the society and cannot legally be released for publication except by a two-thirds vote of the Executive Board. Sec. 4 of Article X, A. E. S. Constitution.

Some of the branches have evidently interpreted the above mentioned section as referring to the release of papers to our Editor-in-Chief, Mr. Richards. This is absolutely wrong, as is shown by Sec. 6, of Art. XI, which specifically provides that all papers must be forwarded to the Editor by the Branch Secretary within seven (7) days after said meeting.

During the past few months papers have been presented before Branch Societies of the A. E. S. and copies forwarded to trade publications almost immediately, the articles having appeared in said publications before it were possible to use the material in the "Review." The Editor of the "Review" is dependent upon these papers for the proper compilation of the society's monthly edition and as it has been considered wrong to promiscously circulate the "Review," and a penalty fixed for the offense, does it not seem reasonable that the Executive Board, and the Editor in particular, should expect the co-operation of every member in their efforts to provide a valuable and interesting collection of papers for each issue of the "Review" rather than to be compelled to play second fiddle to the trade publications or omit the article from the columns of the "Review."

We all owe a great debt to the trade papers. Without their assistance the organization of the A. E. S. would have been improbable, or at best a difficult undertaking. The trade papers have been a godsend to every member of the society who in the past has been progressive enough to peruse their columns. The trade paper is invaluable to the A. E. S. and every member thereof. The trade paper will continue to be appreciated and treasured as of increasing value, regardless of any advance made in the acquisition of knowledge among electro-platers. Fully realizing the aforesaid facts, we do not wish to curtail the opportunities which are made possible for trade journals, but we believe papers read before branch societies should receive first publication in the A. E. S. "Review."

Furthermore, we wish to call the attention of the various Librarians of the branch societies to their duties under Sec. 5 of Art. 5 of the branch constitution, and impress upon them the importance of their office.

Working in harmony with the Secretaries and among the members, soliciting and gathering the papers and other matter for the "Review" will materially assist in makig the "Review" a better publication, and one of incalculable value to the membership at large. Moreover, it is the imperative duty of each Librarian to so perform their office.

We hereby direct that this notice be read and discussed, in order that the matters herein stated may be made perfectly clear to the membership of each branch, and trust that we may receive your co-operative efforts to that end.

Respectfully yours,

W. S. BARROWS,

Pres. A. E. S.